**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of

WILLIAM J. FURNAS : Art Unit: 2878

Serial No: 09/318,249 : Examiner: Thanh X. Luu

Filed: May 25, 1999 : Docket No: 5298-18

For: CONTAINER INSPECTION MACHINE

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Sir:

**REVISED BRIEF ON APPEAL**

This is in response to the Notification of Non-Compliant Appeal Brief dated October 22, 2007.

Applicant is hereby submitting a new Brief which supercedes all prior briefs. This brief has clean claims, no copies of cited references and a copy of the prior decision in this case presented under the heading Related Proceedings Appendix.

## TABLE OF CONTENTS

## (1) Real Party In Interest

This application has been assigned to Emhart Glass SA, which is a wholly owned subsidiary of Bucher Industries SA.

## (2) Related Appeals and Interferences

This is the second appeal in the case. Other than this prior appeal, no other appeal or interference relates to this subject matter.

## (3) Status of the Claims

This appeal is from a final rejection dated April 7, 2005 of independent claims 1 and 2. Claims 3-7 are objected to and would be allowed if rewritten in independent form.

## (4) Status of Amendments

No amendment was filed responding to the final rejection.

## (5) Summary of Claimed Subject Matter

This invention concerns the identification of defects in the wall of a glass bottle. Generally, light is directed at a bottle and when a defect, such as a stone, is present, the light will act differently at the defect than when directed to normal glass. This difference in light action can be observed to identify the defect.

The present invention deals with a machine for inspecting the side wall of a bottle. The machine has a conveyor 12 (page 2, line 17) for supporting a bottle 10 (page 2 line 16) at an inspection station. The inspection station has a CCD camera 14 (page 2, line 19) on one side of the conveyor having a camera image. A light source 16 (rows of L.E.D.'s/page 2, lines 21-24), on the other side of the conveyor, images the bottle on said CCD camera image.

The machine has "energy controlling means" 20 (Page 3, last line) for operating the light source to emit light energy for defining light intensities varying between a minimum brightness level that will permit the identification of a light blocking defect and a maximum brightness level, the brightness level varying spatially, cyclically, and continuously at a rate of change which is less than a rate of change that would be identified as a defect. This structure is the set of timers 20 (page 3, line 36). and a control (schematically illustrated in Figure 3 which sequentially turns on selected rows in a desired sequence to achieve the desired time durations each row is to be operated.

Finally "computer means" 15 (page 5, line 32) analyzes the camera image by comparing neighboring pixels to determine the rate of change in brightness level to identify defects where the rate of change exceeds a defined value. This is computer 15 is a device which can evaluate the image on the CCD camera.

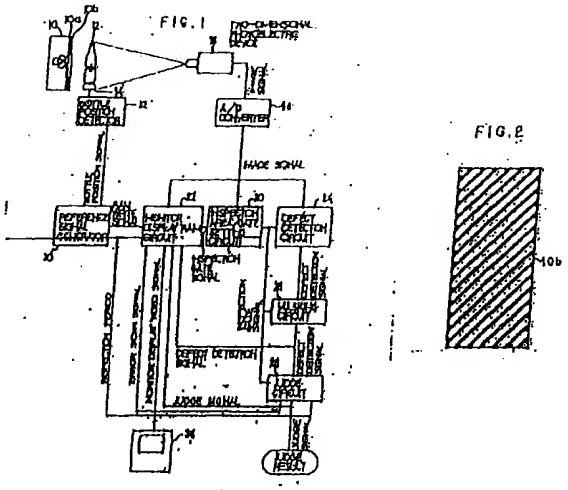
## (6) Grounds Of Rejection To Be Reviewed On Appeal

A. Whether claim 1 is anticipated by Juvinall et al. (U.S. Patent No. 4,601,395).

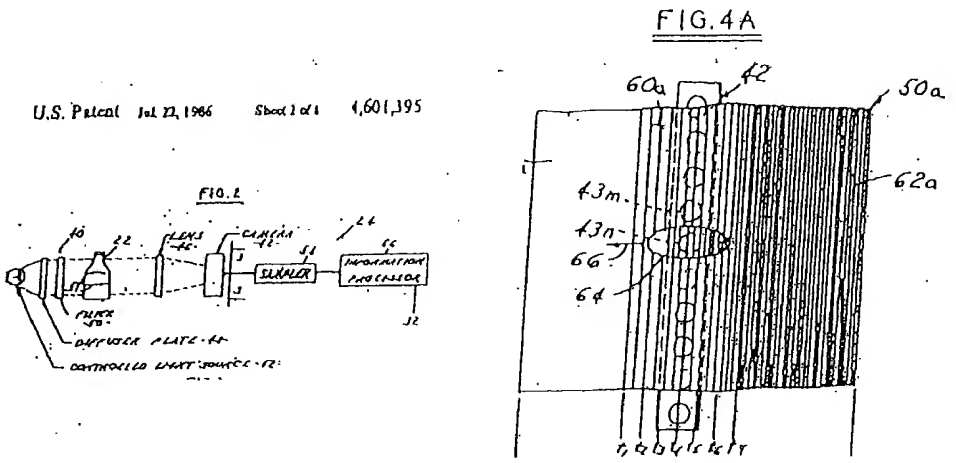
This appeal will deal only with the rejection of claim 1.

## (7) Argument

This invention concerns the identification of defects in the wall of a glass bottle. Generally, light is directed at a bottle and when a defect, such as a stone, is present, the light will act differently at the defect than when directed to normal glass. This difference in light action can be observed to identify the defect. One technique that has been developed is to take the light from a light source and then first direct the light through a diffusion plate to diffuse the light and then pass the diffused light through a slant slit-plate, which splits the light into dark and light stripes. Cited U.S. Patent No. 5,004,909 (Fukuchi), discloses such a design in Figures 1 and 2 presented below. In Figure 1, 10 is the light bulb, 10a is the diffuser plate and 10b is the slant slit-plate. Figure 2 shows the slant slit-plate.



A variation of this approach is to use a filter plate 50a shown in Figure 4A of U.S. Patent No. 4,601,395 (Juvinall) presented below.




The present invention does not follow this well-defined path.

The inventor herein uses the light bulb itself to create the striping. The light bulb 16 (page 2, line 22) defines a large area of light with a large number of vertical rows of L.E.D.s 18 (page 2, line 23). Individual timers 20 (page 2, line 31) are connected to each vertical row of L.E.D.'s 18 so that when the rows are turned on, the timers will time out at selected times (0T,.2T,.4T,.6T, and .8T) of an imaging cycle (the time T required for the row of L.E.D.'s to turn fully on and appear white) with light intensity being a function of the time on (page 2, lines 30-36).

In the prior appeal in this case, the board interpreted the phrase "light source" to include the Juvinall bulb along with the associated Juvinall filter. A copy of the decision of the Board is attached. When "light source is interpreted in this manner, Juvinall had a light source which defined a stripped beam of light which was directed at the object to be inspected.

To more properly define the invention herein, applicant filed new claims, which are presented in the appendix. The examiner has rejected new claim 1 as being anticipated by Juvinall. Claim 1 begins (index numbers have been added and all of this subject matter can be found in the first paragraph of the description found on page 2):

"1. A machine for inspecting the wall of a bottle comprising
a conveyor (12) for supporting a bottle (10) at an inspection station,
the inspection station including
a CCD camera (14) on one side of the conveyor having a camera image,...."
a light source (16 - rows of L.E.D.'s), on the other side of the conveyor, for imaging the bottle on said CCD camera image,..."

The remainder of claim 1, is presented below:

"energy controlling means (20) for operating said light source to emit light energy for defining light intensities varying between a minimum brightness level that will permit the identification of a light blocking defect and a maximum brightness level, the brightness level varying spatially, cyclically, and continuously at a rate of change which is less than a rate of change that would be identified as a defect,
computer means (15) for analyzing the camera image by comparing neighboring pixels to determine the rate of change in brightness level to identify defects where the rate of change exceeds a defined value."

It should be noted that no claim clause is a "means for" clause. Each clause specifies structure and in addition specifies the function of that structure.

Applicant has amended Claim 1 to define the invention as the bulb and the control of the bulb itself to define the desired pattern of light directed past the object being inspected.

Claim 1 defines a light source and "energy controlling means for operating said light source **to emit light energy for defining light intensities varying between** ...." The application discloses this as a light source having a plurality of rows of L.E.D.'s and a structure including a computer control for setting the "on" time of the individual rows of LED's to vary the energy emitted by these rows of L.E.D.s as disclosed.

Juvinall discloses a light bulb that has a single uniform brightness level. You can change the uniform intensity of the Juvinall light bulb, but you can not control the operation of the light bulb to emit energy for defining light intensities varying between a minimum brightness level that will permit the identification of a light blocking defect and a maximum brightness level, the brightness level varying spatially, cyclically, and continuously at a rate of change which is less than a rate of change that would be identified as a defect. It is shown as a single light bulb - the intensity at one location cannot be modified relative to the intensity at another location. The associated Juvinall filter processes the light so that it is discharged directed to the object being inspected as a number of black and white parallel stripes. The filter of Juvinall does not emit anything. The filter redirects light so that it will appear with black lines. The basic teaching in Juvinall is that the light emanating from the light bulb (whether it be a bank of LED's or parallel florescent tubes) is intended to be uniform in intensity and is treated as such.

In claim 1, the light pattern is controlled by the energy controlling means, which operates the bulb in a way to create the desired pattern.

The Examiner now argues that the bulb in Juvinall, not the bulb and the filter in Juvinall, is the light source and that the filter and the light bulb intensity controller in Juvinall are the "energy controlling means". He states that: "...Juvinall ... disclose(s) ... energy controlling means for operating (48,50 (the filter), controller for 52 (the light bulb), see "controlled light source") the light source to emit light energy for defining light intensities varying ...." As already pointed out, making the Juvinall bulb brighter or darker in no way defines the desired light pattern. There is no pattern in the Juvinall bulb. The bulb just gets brighter or darker. The filter in Juvinall does not operate the Juvinall light bulb. The Juvinall filter is passive. It simply receives light from the Juvinall light bulb. The light bulb controller in Juvinall merely changes the intensity of a uniformly illuminated bulb.

Whether the light source in Juvinall is the bulb or the bulb and the filter, Juvinall cannot read on claim 1.

Juvinall, accordingly, does not teach the claimed invention and the Examiner's rejection under Section 102 is in error and should be reversed.

Accordingly, the Examiner's rejection of claim 1 should be presently reversed.

Respectfully submitted,

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March 5, 2008

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## (8) CLAIMS APPENDIX

1. A machine for inspecting the wall of a bottle comprising

a conveyor for supporting a bottle at an inspection station,

the inspection station including

a CCD camera on one side of the conveyor having a camera image,

a light source, on the other side of the conveyor, for imaging the bottle on said CCD camera image,

energy controlling means for operating said light source to emit light energy for defining light intensities varying between a minimum brightness level that will permit the identification of a light blocking defect and a maximum brightness level, the brightness level varying spatially, cyclically, and continuously at a rate of change which is less than a rate of change that would be identified as a defect,

computer means for analyzing the camera image by comparing neighboring pixels to determine the rate of change in brightness level to identify defects where the rate of change exceeds a defined value.

2. A machine for inspecting the wall of a bottle according to claim 1, wherein said light source comprises a plurality of L.E.D. rows.

3. A machine for inspecting the wall of a bottle according to claim 2, wherein said plurality of L.E.D. rows define a plurality of row groups each including a row having a maximum brightness level, a row having a minimum brightness level, at least one row intermediate said row having said maximum brightness level and said row having said minimum brightness level having a brightness level between said minimum brightness level and said maximum brightness level, and at least one row on the side of the row having the minimum brightness level remote from said row having the maximum brightness level having a brightness level between the minimum brightness level and the maximum brightness level.

4. A machine for inspecting the profile and wall of a bottle according to claim 3, wherein there are a plurality of vertical L.E.D. rows intermediate the row having the minimum brightness level and the row having the maximum brightness level and the brightness level of said plurality of intermediate rows uniformly reduces from the row having the maximum brightness level to the row having the minimum brightness level.

5. A machine for inspecting the profile and wall of a bottle according to claim 4, wherein there are a plurality of vertical L.E.D. rows on the side of said row having the minimum brightness level remote from said row having the maximum brightness level and the brightness level of said plurality of said rows on the side of said row having the minimum brightness level remote from said row having the maximum brightness level uniformly increasing in brightness level proceeding away from the row having the minimum brightness level.

6. A machine for inspecting the profile and wall of a bottle according to claim 5, wherein the row having the minimum brightness level has a brightness level of about 20% of the maximum brightness level and wherein each of said vertical L.E.D. row groups has three vertical rows intermediate the row having the minimum brightness level and the row having the maximum brightness level, with the row adjacent the row having the minimum brightness level having a brightness level of about 40% of the maximum brightness level and the row adjacent the row having the maximum brightness level having a brightness level of about 80% of the maximum brightness level and the intermediate of the three vertical rows intermediate the row having the minimum brightness level and the row having the maximum brightness level having a brightness level of about 60% of the maximum brightness level.

7. A machine for inspecting the profile and wall of a bottle according to claim 6, wherein each of said vertical L.E.D. row groups has three vertical rows on the side of the row having the minimum brightness level remote from the row having the maximum brightness level, with the row adjacent the row having the minimum brightness level remote from the row having the maximum brightness level having a a brightness level of about 40% of the maximum brightness level and the next of the three vertical rows on the side of the row having the minimum brightness level remote from the row having the maximum brightness level having a brightness level of about 60% of the maximum brightness level and the the last of the three vertical rows on the side of the row having the minimum brightness level remote from the row having the maximum brightness level having a brightness level of about 80% of the maximum brightness level.

## (9) EVIDENCE APPENDIX

A. U.S. Patent No. 5,004,909 (Fukuchi)

B. U.S. Patent No. 4,601,395 (Juvinall)

## (10) RELATED PROCEEDINGS APPENDIX

Decision on Appeal (Appeal No. 2003-0296) dated April 28, 2004.

Paper No. 15

UNITED STATES PATENT AND TRADEMARK OFFICE



BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WILLIAM J. FURNAS

Appeal No. 2003-0296
Application No. 09/318,249

ON BRIEF

Before HAIRSTON, LEVY, and SAADAT, Administrative Patent Judges.
LEVY, Administrative Patent Judge.

## DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1 and 2. Claims 3-7 have been indicated by the examiner (page 4) as allowable if rewritten in independent form (Paper No. 11, mailed December 3, 2001).

## BACKGROUND

Appellant's invention relates to a container inspection machine using a source having spatially, cyclically and continuously varying intensity. An understanding of the

invention can be derived from a reading of exemplary claim 1, which is reproduced as follows:

1. A machine for inspecting the wall of a bottle comprising

a conveyor for supporting a bottle at an inspection station,

the inspection station including

a CCD camera on one side of the conveyor having a camera image,

a light source, having an illumination area, on the other side of the conveyor, for imaging the bottle on said CCD camera image,

means for defining on said illumination area light intensities varying between a minimum brightness level that will permit the identification of a light blocking defect and a maximum brightness level, the brightness level varying spatially, cyclically, and continuously at a rate of change which is less than a rate of change that would be identified as a defect,

computer means for analyzing said camera image by comparing neighboring pixels to determine the rate of change in brightness level to identify defects where the rate of change exceeds a defined value.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

| | | |
|---|---|---|
| Juvinall et al. (Juvinall) | 4,601,395 | July 22, 1986 |
| Ishikawa et al. (Ishikawa) | 4,924,083 | May 8, 1990 |

Claim 1 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Juvinall.

Claim 2 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Juvinall in view of Ishikawa.

Rather than reiterate the conflicting viewpoints advanced by the examiner and appellant regarding the above-noted rejections, we make reference to the examiner's answer (Paper No. 13, mailed July 8, 2002) for the examiner's complete reasoning in support of the rejections, and to appellant's brief (Paper No. 10, filed October 1, 2001) and supplemental brief (Paper No. 12, filed April 11, 2002) for appellant's arguments thereagainst. Only those arguments actually made by appellant have been considered in this decision. Arguments which appellant could have made but chose not to make in the brief have not been considered. See 37 CFR 1.192(a).

## OPINION

In reaching our decision in this appeal, we have carefully considered the subject matter on appeal, the rejections advanced by the examiner, and the evidence of anticipation and obviousness relied upon by the examiner as support for the rejections. We have, likewise, reviewed and taken into consideration, in reaching our decision, appellant's arguments set forth in the briefs along with the examiner's rationale in support of the

rejections and arguments in rebuttal set forth in the examiner's answer.

Upon consideration of the record before us, we affirm. We begin with the rejection of claim 1 under 35 U.S.C. § 102(b) as being anticipated by Juvinall.

To anticipate a claim, a prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently. In re Schreiber, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997). The examiner's position is set forth on pages 3-5 of the examiner's answer. Appellant asserts (brief, pages 4 and 5) that as shown in figure 2, Juvinall uses a single conventional light bulb, with a single intensity. It is argued (brief, page 5, and see also supp. brief, page 2) that

> Intensity levels varying between a minimum brightness level and a maximum brightness level can not be defined on that light source.

It is further argued (supp. brief, pages 2 and 3) that

> Juvinall discloses a filter which receives the light from the illumination device and defines a light pattern having varying intensities on the filter. That is the prior art. The examiner erroneously argues that this filter defines these light variations on the light source. To the contrary, Juvinall defines these light variations on the filter. There is no light variation on the light source in Juvinall. The claimed invention requires that the variation in intensities be created "on said illumination area". Juvinall does not do this and the section 102 rejection is erroneous.

The examiner responds (answer, page 6) that

> As shown from Figures 2 and 4 of Juvinall et al. The filter (50) causes the illumination area (dotted lines of Figure 2) of the light source to have a variety of intensities. That is, the light source (52) illuminates through the filter (50), generating an illumination area of the light source on the other side of the filter, which varies as claimed (see Figure 4).

We begin with the issue of claim construction. Analysis of whether a claim is patentable over the prior art begins with a determination of the scope of the claim. The properly interpreted claim must then be compared with the prior art. Claim interpretation must begin with the language of the claim itself. See Smithkline Diagnostics, Inc. v. Helena Laboratories Corp., 859 F.2d 878, 882, 8 USPQ2d 1468, 1472 (Fed. Cir. 1988). Accordingly, we will initially direct our attention to appellant's claim 1 to derive an understanding of the scope and content thereof. The general claim construction principle that limitations found only in the specification of a patent or patent application should not be imported or read into a claim must be followed. See In re Priest, 582 F.2d 33, 37, 199 USPQ 11, 15 (CCPA 1978). One must be careful not to confuse impermissible imputing of limitations from the specification into a claim with the proper reference to the specification to determine the meaning of a particular word or phrase recited in a claim. See

E.I. Du Pont de Nemours & Co. v. Phillips Petroleum Co., 849 F.2d 1430, 1433, 7 USPQ2d 1129, 1131 (Fed. Cir.), cert. denied, 488 U.S. 986 (1988).

What we are dealing with in this case is the construction of the limitations recited in the appealed claims. As stated by the court in In re Hiniker Co., 150 F.3d 1362, 1369, 47 USPQ2d 1523, 1529 (Fed. Cir. 1998) "[t]he name of the game is the claim." Claims will be given their broadest reasonable interpretation consistent with the specification, and limitations appearing in the specification are not to be read into the claims. In re Etter, 756 F.2d 852, 858, 225 USPQ 1, 5 (Fed. Cir. 1985).

We find that the claim language "a light source, having an illumination area" and

> means for defining on said illumination area light intensities varying between a minimum brightness level that will permit the identification of a light blocking defect and a maximum brightness level, the brightness level varying spatially, cyclically, and continuously at a rate of change which is less than a rate of change that would be identified as a defect,

does not require that the light source produce light of varying intensities. Nor does the claim language provide for a light source that does not have an illumination area. The claim language "a light source, having an illuminate area" is clear, and requires that the illumination area be part of the light

source, since the light source has the illumination area. Moreover, the "means for ..." language of claim 1 refers to the varying brightness levels created by the timers 20 for the vertical rows (figure 2) and the single controller for operating eight rows (figure 3).

From our review of Juvinall, we do not agree with appellant (brief, page 4) that Juvinall uses a single conventional light bulb, but rather we agree with the examiner (answer, page 5) that light source 40 of Juvinall comprises a plurality of incandescent lamps disposed in three columns (col. 4, lines 27-29). In addition, from our review of claim 1, we find that claim 1 does not require that the varying levels of intensity are defined on the light source, but rather that the varying levels of intensity are defined on the illumination area of the light source. Appellant does not dispute that Juvinall discloses the claimed varying of the levels of intensity, but asserts that it is provided by the filter of Juvinall and not the illumination area of the light source (supp. brief, page 2, last paragraph). We do not agree with appellant (id.) that the filter of Juvinall receives light from the illumination device, but rather we find that the filter of Juvinall receives light from the light source

52, via diffuser plate 48 (figure 2). We observe that appellant's specification (page 4) discloses

> Calculations based upon the actual performance of the illumination method, in this case, L.E.D./diffuser combination, will determine the method of calculating corrections to produce the desired spatially cyclically continuously varying intensity between the extremes of dark and light intensity source.

From this disclosure of appellant's we find that it is the combination of the LEDs and the diffuser which relate to the method of calculating corrections to produce the desired spatially cyclically continuously varying intensity between the extremes of dark and light intensity source. Thus, the issue is whether the filter of Juvinall is part of the illumination area of the light source. Although not brought to our attention by either the appellant or the examiner, we find, sua sponte, that Juvinall discloses (col. 4, lines 50-56) that

> Within light source **40**, which is illustrated in plan view in FIG. **1** and in side elevation of FIG. 2, a diffuser plate **48** and an intensity filter plate **50** are positioned to intercept and direct light energy from a source **52** of illumination through the sidewall of a container **22** and through lens **46** onto camera **42**.

From this disclosure of Juvinall, we find that the filter 50 is located within light source 40. Because the filter, which provides the varying intensities, is within light source 40, we find that the filter is in the illumination area of the light

source of Juvinall. In addition, we observe that the structure disclosed by appellant for carrying out the claimed "means for . . ." of claim 1 is different from the filter of Juvinall. As to whether filter 50 of Juvinall constitutes the same or equivalent structure for carrying out the claimed function of varying intensities, we note that appellant has not raised the issue of 35 U.S.C. § 112, sixth paragraph, notwithstanding the fact that the limitation is written in means-plus-function language and appellant's disclosed structure is the timers and controller, which are not the same as the filter of Juvinall. Nevertheless, because appellant has not raised the issue of 35 U.S.C. § 112, sixth paragraph, we find that the means of Juvinall are equivalent to the structure disclosed by appellant, since the claimed function is performed.

From all of the above, we find that the prima facie case of anticipation of claim 1 by Juvinall has not been successfully rebutted by appellant. The rejection of claim 1 under 35 U.S.C. § 102(b) is therefore affirmed.

We turn next to the rejection of claim 2 under 35 U.S.C. § 103(a) as being unpatentable over Juvinall in view of Ishikawa. The examiner's position (answer, page 5) is that Ishikawa discloses a plurality of lamps disposed in three columns, but

does not disclose that the lights are LEDS. To overcome this deficiency of Juvinall, the examiner turns to Ishikawa for a teaching of using a plurality of LED rows for a bottle inspection device. The examiner asserts (id.) that

> it would have been obvious to a person of ordinary skill in the art at the time the invention was made use a plurality of LED rows as the light source of the device of Juvinall et al. in view of Ishikawa et al. to provide more efficient illumination and to reduce operating costs.

Appellant asserts (brief, page 5) that

> Claim 2 defines the light source as a plurality of rows of L.E.D.s which per claim 1 define light source areas having different intensity levels. Juvinall teaches a single light bulb -The obvious conversion would be to an L.E.D. light source having a uniform intensity.

As we stated, supra, claim 1 does not require light source areas having different intensity levels, but rather that the varying intensity levels are defined on the illumination area of the light source. Also as stated, supra, Juvinall does not disclose the use of a single bulb, but rather a plurality of lamps disposed in three columns. From the disclosure of the prior art, we find that an artisan would have been motivated, for the reasons advanced by the examiner, to use LEDs instead of incandescent lamps for the columns of lamps provided.

Accordingly, the rejection of claim 2 under 35 U.S.C. § 103(a) is affirmed.

CONCLUSION

To summarize, the decision of the examiner to reject claim 1 under 35 U.S.C. § 102(b) is affirmed. The decision of the examiner to reject claim 2 under 35 U.S.C. § 103(a) is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136 (a).

AFFIRMED

KENNETH W. HAIRSTON
Administrative Patent Judge )

STUART S. LEVY
Administrative Patent Judge ) BOARD OF PATENT APPEALS AND INTERFERENCES

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